IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	LaBelle et al.	:	
Serial No.:	10/658,541	:	Examiner: Kosson, Rosanne
Filing Date:	September 8, 2003	:	Art Unit: 1653
Title:	**Nanoengineered Biophotonic Hybrid Device**		

AMENDMENT IN RESPONSE TO ADVISORY ACTION BEFORE FILING OF AN APPEAL BRIEF

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Responsive to the Examiner's Advisory Action dated August 25, 2005, please amend the above-identified application as set forth below:

Amendments to the specification:

On page 14, after line 10:

~~Absorbance spectra of i~~ Isolated RC⁻ chlorosomes in Tris buffer exhibit the ~~characteristic~~ absorbance peaks (solid line) shown in the normalized absorbance spectral plot of Fig. 9A. Immobilizing the RC⁻ chlorosomes in PVAC polymer, however, destroyed the chlorosomes as evidenced by the dashed line normalized absorbance ~~absorbent~~ spectruma plotted in Fig. 9A. This was true of other immobilization attempts with other polymers.

Intact C. *aurantiacus* bacteria display a unique adaptive ability to reversibly and enzymatically assemble and disassemble the foregoing structures to protect the organism from photo-induced damage. As is expected, the spectral peaks of Fig. 9 ~~of Fig. 6~~ are highly related to growth conditions of the whole cell C. *aurantiacus* bacteria. These are also related to the isolation techniques that result in purified chlorosomes. An abbreviated form of the important basic mechanisms of energy transfer that occur between the molecules of the RC⁻ chlorosome are as depicted in Fig. 10.

On page 19, lines 1 - 10:

Another technique utilized the evaporation procedure as well as an aqueous method to allow incorporation of the chlorosomes onto a glass surface. Both techniques start with taking 0.5µl of a known concentration of chlorosomes and placing it onto a borosilicate glass coverslip (Fisher Scientific). In the evaporation method, evaporation, under vacuum, is performed overnight and then the sample is sealed onto a fluorescent antibody microslide (Fisher Scientific). In the physical adsorption method, the slide is prepared in the aqueous phase and inverted during sealing, thus allowing for ensuring a hydrated sample as well as diffusion of the

chlorosomes onto the surface of the hydrophobic glass. Samples were also studied under laser scanning confocal microscopy (instrument from LEICA) to investigate orientation and ~~selected~~ function (~~i.e.~~ stability) was observed with absorbance spectroscopy of the sample afterwards.

Amendments to the claims:

1 - 26. (cancelled without prejudice)

27. (currently amended) A method of making a hybrid photoactive device, comprising: ~~including:~~

(a) providing photosynthetic chlorosome-containing bacteria ~~C.~~ *Chloroflexus aurantiacus*;[[,]]

(b) extracting the RC^- chlorosomes from the bacteria;[[,]]

(c) providing a photoactive semiconductor;[[,]] and

(d) locating the RC^- chlorosomes proximate a light receiving surface of the photoactive semiconductor, wherein step (c) includes providing a photoactive semiconductor having a light response that is diminished at a first range of light wavelengths, and step (a) comprises choosing an RC^- chlorosome having

(i) light response that is enhanced at a second range of light wavelengths that coincides, at least in part, with the first range of light wavelengths, and

(ii) light emission outside the first range of light wavelengths, and wherein choosing an RC^- *chlorosome* comprises force adapting bacteria with chlorosomes with the light response enhanced at the second range of light wavelengths and light emission outside the first range.

28. (currently amended) The method according to claim 27, wherein force adapting comprises

(a) design of experiment determination of environmental factors forcing adaptation of bacteria based upon multiple environmental variables applied to C. *aurantiacus* sample bacteria; and

(b) exposing the C. *aurantiacus* bacteria to an environment in which the factors identified in the previous step are present to force adapt the exposed C. *aurantiacus* bacteria.

29 - 30. (cancelled without prejudice)

31. (original) The method according to claim 28, wherein force adapting comprises calculating a figure of merit for chlorosomes of the bacteria and identifying environmental factors resulting in an acceptable figure of merit.

32. (original) The method according to claim 31, wherein the figure of merit is:

$$FoM = \frac{\%T_{440\ (\text{Bchl c Soret})}}{\%T_{440\ (\text{Bchl c Soret})} + \%T_{460\ (\text{Carotenoid})}} * \frac{\%T_{795\ (\text{Bchl a Baseplate})}}{\%T_{740\ (\text{Bchl c Oligomeric Qy})}}$$

33. (previously amended) The method according to claim 27, wherein the photoactive semiconductor diminished response is in the blue region of the visible spectrum and force adapting the bacteria comprises force adapting the bacteria to have chlorosomes responsive to light in said blue region to emit light outside said blue region.

34. (original) The method according to claim 33, wherein the light emitted by the chlorosomes is light in the near infrared region of the visible spectrum.

35 - 43. (cancelled without prejudice)

44. (previously presented) A hybrid photoactive device made by the method of claim 27.

45. (previously presented) A hybrid photoactive device made by the method of claim 33.

46. (previously presented) A hybrid photoactive device made by the method of claim 34.

REMARKS

Except in relation to claim 28 as discussed below, the amendments to the specification and claims in this application are those that the examiner has indicated would place the application in condition for allowance. The amendments are made here without agreeing that previous amendments included new matter. Withdrawn claims 35 - 43 have been cancelled without prejudice as requested. As explained in the voice message left for the examiner in charge of this application on September 16, 2005, a slight change has been made to claim 28 as proposed by the examiner. At line 5, step (b) of claim 28 has been corrected to indicate that it is the bacteria exposed to an environment in which the factors identified in step (a) are present that are force adapted. Antecedent basis for "the exposed C. *aurantiacus* bacteria" of lines 7 - 8 appears at line 6 "exposing C. *aurantiacus* bacteria." The examiner's proposed draft of claim 28 referred to force adaptation of the "samples" by the exposure of the bacteria to an environment in which the identified factors of step (a) are present. This is not correct. In any event, even if it were the "sample" that were adapted in step (b) (which is not the case), the claim as presented here would still be acceptable as it refers to the exposed bacteria as that which is force adapted.

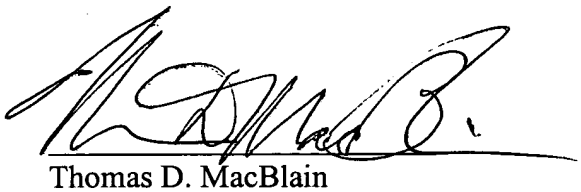
With the above the application is now in condition for allowance. Favorable action to that end is requested.

Should the examiner have questions, comments or suggestions concerning this application, the examiner is invited to telephone the undersigned attorneys for applicant or to email them at the contact information given below.

Respectfully submitted,

GALLAGHER & KENNEDY, P.A.

Date: 9/16/05

By: 

Thomas D. MacBlain
Reg. No. 24,583
Attorneys for Applicant

Gallagher & Kennedy, P.A.
2575 East Camelback Road
Phoenix, AZ 85016
(602) 530-8088 phone
(602) 530-8500 fax
tdm@gknet.com